

## **Queering dissection: “I wanted to bury its heart, at least”**

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### **Abstract**

In this chapter, I explore dissection as a material-discursive phenomenon in three different settings: My own high school dissection experiences; my experiences with dissection as a teacher of science; and a dissection experience that took place in a local high school where I have conducted research. Given its prominence in the secondary school science experience, dissection can serve as a microcosm for analyzing the complex and intersecting roles of identity, such as gender with race, cultural practices, and science (as it plays out in schools). I draw on Sara Ahmed’s (2006, 2010) scholarship on orientations to diffract the various participants’ orientations to the dissection, with a particular focus on gender at the intersections of race, class, and cultural practices. The experiences of two girls, in particular, reveal multiple points of difference that constitute considerable (yet overlooked) tensions in secondary science education.

### **Introduction: Becoming a (Science) Teacher**

My first science classroom teaching job was at a junior high school in the South Bronx, NY. At the time, about 99% of the students were from economically oppressed minoritized communities. We didn’t really have a budget for materials, and barely had enough books for every student. In the spring of my first year teaching, the science department head finally gave me a tour of the science supply room. Many of the supplies seemed like they’d been there since the 70s. I scrounged up what I could, including a large plastic jar of preserved frogs and a couple of jars of owl castings for dissection. We didn’t have science labs, and I traveled from class to class (students walking the halls between classes was seen as “dangerous”) which meant I carried the supplies with me.

In high school (between ages 14-18 in the USA), I had made an ethical decision to refrain from dissection in science classes. I didn’t think there was a justifiable need for high school students to dissect animals in order to be able to identify their organs. It seemed to me to be both disrespectful and nonessential and it made me feel sick to see students groaning and joking during dissection. I tried to register for Anatomy and Physiology my senior year (i.e. last year of high school, age 17], but I was told that I wouldn’t be able to take that class if I didn’t dissect – even if I were to sit out and observe. I wrote a front page story for our school newspaper condemning the practice of forcing students to dissect as a condition for enrollment in specialized science courses. I don’t think it changed anything, but I felt that at least I had been able to take a very public stance on the issue.

Years later at the junior high school where I first taught, I rarely saw Edwin in class. He was often suspended or just wouldn’t come to school. Many of the other teachers were either (quietly or openly) relieved when Edwin was out. When he was in class, he was often oppositional with

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teachers, bullied other kids, or, on a 'good' day, put his head down, but ultimately, Edwin was a child in pain. And he liked science. Over time, he began to participate a little bit more and more each day and he started to come to class more and more.

I arranged to dissect one frog per class as a demonstration (given the limited number of frogs as well as dissection tools) and to project the dissection using a document camera (we had one for the entire school, though it was rarely used) while inviting volunteers to come up and take turns doing the dissection. In spite of my own discomfort with dissection, I thought it would somehow be unfair of me to withhold this opportunity from my students who already had such limited access to laboratory resources. I remember several students in each class asking me how the frogs died. I actually didn't really know what the process was for euthanizing frogs for dissection, but I lied and said they had all died of natural causes and had been donated to science.

I remember setting up the dissection for Edwin's class. 'Miss Tolbert, that ain't right,' he protested quietly. I lied to him, too: "Don't worry; they all died of natural causes." As we took turns cutting into the frog, he sat quietly in the back corner. I saw him become overwhelmed with hurt and anger. My heart felt heavy. Somehow, I knew I had betrayed him. He walked out of the class. After that, I rarely saw him. His love of science – at least, from a school-based perspective – ended that day. His story has haunted me since.

I use this vignette for two reasons: First, it raised difficult questions for me about ethics and science teaching, which have stayed with me and which underlie my concerns about gender and dissection in this chapter. Second, it is consistent with a feminist method of thinking with care, trying not to present myself as the 'enlightened outsider who knows better' (Puig de la Bellacasa, 2012: 197), but rather as someone who struggled personally with the issues I continue to analyze in another woman's classroom. In this chapter, therefore, I think with my own experiences as a student and teacher of science, my former students, a teacher collaborator, her students, and the more-than-human animals who were dissected. Thinking with care in this way has compelled me to more deeply consider the following questions, which I explore in this chapter: How is it that we, as students and educators, are taught to communicate what science is/should be? In what ways is taking up emotional/ethical stances (orientations) in school science gendered, and (therefore) marginalized? What compelled me to set aside my own ethical dilemmas in this case, rather than to engage them and share them openly with my students? What would a feminist approach to science teaching look like – that is, an approach committed to both the critique and transformation of scientific practice – in a fairly 'standard' secondary science laboratory activity like dissection?

## **Dissection in Secondary Science Classrooms**

Dissection is often seen as a cornerstone of life sciences education, particularly in secondary school settings. Some critical and feminist scholars have pointed out ways in which dissection embodies violence and oppression in science and science education (Oakley, 2009), while others have highlighted the potential of dissection as 'gross pedagogy' that can disrupt gender norms (Weinstein & Broda, 2009). Oakley (2009) points out how the practice of dissection in schools raises social concerns, animal welfare concerns, health and environmental concerns, and pedagogical concerns for students and teachers. She and other feminist scholars have argued that

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the objective detachment of scientific practice (i.e., researcher/researched dichotomy and objectification of the researched such as that which is embodied in dissection experiences) is masculinist, and marginalizes – and even serves to push out – students who take up a more empathetic stance with regard to 'researcher' and 'the researched' (Fox Keller, 1984; Oakley, 2009). On the other hand, Weinstein & Broda (2009: 771) illustrate how one teacher, by engaging students at a private Catholic girls' school in the 'public' handling of pig organs 'broke taboos, even if unconsciously held, of public performances of gender and class' where 'the girlishness of the students was directly challenged'.

Some scholars argue that dissection in secondary schools has demonstrated very little to no advantage over other approaches to biology education (such as computer models) in terms of preparing students to learn and understand anatomical features of various animals (Hug, 2008; Milano, 2010). One benefit of dissection over other simulative approaches to dissection tasks is the preparation of students to learn actual dissection skills (Divilliers & Monk, 2005). Some scholars question, however, whether or not this advantage outweighs the disadvantage of turning students who are averse to dissection away from pursuing any interest in the biological sciences (Divilliers & Monk, 2005; Oakley, 2009). Research on dissection in secondary schools has also pointed to how access to dissection experiences is higher in well resourced, White-majority schools compared to under-funded schools serving minoritized students (Divilliers & Monk, 2005). In this regard, having the option to participate in dissection or not at the secondary level could be viewed as a structural inequity as well as a marker of racial/socioeconomic status and privilege. Few science education scholars have addressed how the intersecting roles of race, gender, cultural practices, and materiality intra-act for and among girls of color within masculinist and colonizing contexts of science and science education (Scantlebury, 2005), and even fewer studies have attended to the intersecting cultural, gendered, and racialized experiences of students during classroom dissection activities (Bruna, 2010).

## **Orientations, Diffractions, and Dissections**

Orientations are about the direction we take that put some things and not others within our reach (Ahmed, 2010: 245).

As a former social/environmental studies (accidentally) turned science teacher and now (science) teacher educator, I am particularly invested in re-thinking science education NOT as an enterprise designed to funnel students into some sort of sterile, masculinist STEM pipeline, but rather how to better, more respons-ably intra-act within 'the various technoscientific enterprises in which we are all implicated' (Barad, 2000: 223). Sara Ahmed's (2006, 2010) work on orientations is particularly useful here in thinking about how students' identities, bodies, experiences and cultural practices intra-act with biological 'objects,' or 'specimens.' She writes that orientations matter:

In both senses of the word 'matter.' First, orientations matter in the simple sense that orientations are significant and important. To be oriented in a certain way is how certain things come to be significant, come to be objects for me ... Orientations also matter in the second sense of being about physical or corporeal substance. Orientations shape the corporeal substance of bodies and whatever occupies space. Orientations affect how

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subjects and objects materialize or come to take shape in the way that they do (Ahmed, 2010: 235).

Ahmed's writings on orientations and objects reveals the gendered and (domestic) labor relations that are invisible in Husserl's phenomenological framing/bracketing of the philosopher's table. Both her work and Barad's take up the ways in which our inheritances intra-act with objects and beings. In my case, I'm interested in how our intra-actions with objects – in this case, the 'specimen' in dissection – constitute orientations away from versus toward the sciences.

In the transcribed excerpts which follow, I draw on Ahmed's work to illustrate how students and teachers differently orient to the 'specimen,' and, therefore, to school science, and how these orientations relate to gender, race, class, and cultural practices. I use diffractive analysis as thinking with theory and care (Barad, 2014; Mazzei, 2014; Puig de la Bellacasa, 2012) to generate questions and perspectives (knowledge) around difference (rather than coding for similarities, or categories), primarily from the students' conversation with me, but also from my own and the science teacher, Ms. Bell's, experiences with dissection as both teachers and students of science. These points of difference among the various human participants' orientations – including myself as (becoming) teacher and researcher – toward dissection and perhaps, school/science more broadly, constituted within and diffracted through the dissection apparatus (i.e. the scalpel, tray, and 'specimens') may help us re/think what it means, or can mean, to become a student/teacher/doer/thinker in science, and society.

### **Dissection as Opportunity**

Ms. Bell works in a small school with very limited resources. The school serves predominantly minoritized students in a low-income neighborhood. As a researcher interested in youth empowerment through science education at the school, I regularly met with Ms. Bell as well as separately with a group of students who would share with me their perspectives about science and science class at their school. Despite limited resources, Ms. Bell used crowdfunding to raise money for cats that her ninth graders would dissect in their Integrated Science class:

Dissection is something I do every year and I feel strongly about doing dissection because I had a very empowering moment in 10th grade when I was allowed to dissect a cat and based on my performance I was allowed to go see open heart surgery...it was during that experience that I decided what I wanted to do in life and that was to understand why people die and how they die and what causes death because I literally watched a woman be taken off, basically killed and then brought back to life and a machine was just doing her processes for her. I share that experience with my students because the cat is something, is a large organism and it's something that not all high school science teachers teach and I really feel strongly about using a mammalian specimen and a cat as opposed to a fetal pig [because the cat] has some unique characteristics...I run through it as, watch me do this step, then you go do it, then come back and see me do it instead of me standing over them or them just reading a dissection guide and when I was in school I used a dissection guide but then I spent years, over 10 years in pathology and never had a dissection guide for doing the human so that's how I teach and when I would teach medical residents how to dissect during an autopsy...it's

probably the best three weeks of the year for me as a teacher. [Ms. Bell, Interview, 3/15/16]

For Ms. Bell, dissection was a transformative experience that oriented her toward science, a definitive turning point, even, that led her to pursue a career in forensic pathology, and eventually, science teaching. The following conversation is taken from an audio-recorded meeting with this small group of students from Ms. Bell’s class, including two girls, Nicole<sup>1</sup>, who is Mexican American, and Snoopy, who is Pacific Islander, as well as one boy, Marcos, who is Mexican American. We met several times during the semester, and during this particular meeting the topic of dissection came up as something they wanted to talk about, as they recounted their experiences in their science class the week before.

Nicole: We did dissections and it was optional, but if you didn’t do it you had to do another whole other thing and it was vocabulary and stuff. But there was some groups in the classroom that just didn’t do either of them. They just kind of sat there and it was kind of like a chill period for them...I feel sad that they’re taking advantage – they should have been at least included in the opportunity to dissect a cat. We were dissecting cats. We were dissecting the eyeballs [prior to dissecting the cat]. It’s sad that they missed out on the opportunity to do that. Then Snoopy didn’t do it at all.

The specimens constitute an opportunity for some students to learn science. Some students choose not to do the dissection or the alternative activity: ‘it was kind of like a chill period for them,’ which Nicole views as taking advantage of the choices provided by the teacher (dissection vs. vocabulary activity). Also, I note here that though I ask them what they think, Nicole replies with a comment about how she feels, specifically, about how she feels sad. This becomes a recurring refrain throughout our conversation. She orients toward/away from the ‘object’ or ‘specimen’ with feelings, emotion, sadness—not ‘thinking,’ per se, at least, not in the traditional sense of the word.

Snoopy: I didn’t do the eyeballs [that day] because I was sick [that day]. But I did the vocabulary.

Nicole: You didn’t do the cat, either.

Snoopy: I did the vocabulary though.

Snoopy’s orientation away from the dissection activity, she wants to be clear, it seems, is not an orientation away from schoolwork – in other words, she asserts (twice) that she was not one of those who was ‘taking advantage.’

### **Making Sacred Spaces for Specimens in Science**

Nicole continues talking about her feelings of sadness during the dissection activity. She reveals not only the lack of space for emotional responses, such as abhorrence, to scientific practices but

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<sup>1</sup> Student participants chose their own pseudonyms.

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also the lack of attention to rituals of relationship in science, to sacred forms, like burial, of honoring the more-than-human beings with whom we are in relation (see Higgins & Tolbert, forthcoming).

Nicole: Well, I didn't do any dissecting. I was watching. It's so sad.

Sara: What about it made you feel sad?

Nicole: I wanted to bury its heart at least. Ms. Bell cut open its heart and I was sad, like that's sad. It's really horrible. ...She [Ms. Bell] was 'no, we're going to just throw it all away.'

Nicole's experience parallels those documented by other women in science who highlight how 'a feeling for the organism' is not encouraged in science, but is seen to be integral to feminist scientific knowledge production (Barton & Osborne, 2001; Fox Keller, 1984; Stengers, 2010). Beyond having a feeling for the organism, Nicole wants to make room for a sacred practice of ritual in the science classroom. She wants to bury its heart at least, but there is not space for this in school or science. 'Spaces, too are oriented in the sense that certain bodies are in this place or that place' (Ahmed, 2010: 235). 'Specimens' (dead cats) are to be disposed of (thrown away) in biohazard waste receptacles, not buried.

### **Disrupting and Reinforcing Gender Performances**

Despite her own and others' discomfort with the dissection activity, Nicole describes how other students became more engaged once they saw other students', like Marco's, enthusiasm for the activity.

Nicole: But I did definitely notice kids were much more open to the opportunity once they saw other kids [do it]... Like some of the leaders, like Marcos, wanted to do cat. So all the basketball guys – I'm sorry, but they did – they were like, 'ok, fine we'll go help you do it.'

Sara: Was that because they didn't really want to necessarily do it themselves?

Nicole: I don't think anybody really wanted to do it at first, except for four kids.

Marcos: I wanted to do it.

Snoopy: He's one of the four that wanted to do it.

Nicole: I think after that they saw some leadership take place. We definitely got more involved in it. Ms. Bell showed us how to do it. She kind of just let them free reign do their own cat. She wasn't even paying attention to them. She just gave them scalpels and were like 'figure it out.'

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Nicole publically recognizes Marcos as a leader here. Marcos is mostly quiet throughout our conversation, not really relating at all to the girls' concerns. Nicole sees Marcos, a great basketball player, as someone who has clout (leadership), especially with the basketball team. Nicole sees Marcos' ability to get others ('the basketball guys') to participate in the dissection, despite their hesitations, as related to 'leadership' taking place but, yet, not students' refusal to participate as leadership, regardless of her own discomfort with the dissection activity. Nicole does not position herself here as a leader. The boys who can get other boys to participate are leaders. Nicole's positioning herself as non-leader and Marco as leader is a performance, a subjectification, of gendered hierarchies around leadership (Butler, 1990). While reinforcing gendered notions of leadership, the dissection experience also created opportunities for students to disrupt gender stereotypes. For example, the 'specimens' are entangled with student identity performances of being 'creepy,'.

Sara: So you said at first only four people who wanted to do it. Why? Why do you think? Did they say? Did you guys have a conversation about why people would want to?

Nicole: Two of the girls in our class were very interested in the medical field. It's obviously been part of the medical field for a long time. A few of the girls were very interested in dissection. Some of the girls were just like creepy. They wanted to dissect stuff. Marcos was just trying to be creepy.

### **A Collision of Cultural Practices: 'If You're Going to Kill It, You Should Eat It'**

Nicole shares that she is not opposed to the slaughtering of animals in some contexts. For example, the cultural practice of slaughtering pigs in Mexico is *different*. Nicole orients differently to the practice of dissection because of the way the animal is treated in the end (eaten, versus "thrown away").

Nicole: [Ms. Bell's] like 'cut it open' and then she's like, 'this how you do it' – Oh, god it was horrible. I've never been so upset, I don't think. Watching. I've seen pigs. I think that having a pig ... I wasn't that upset...Just like it happens, like in Mexico. They get pigs, cut them open, cut off its head.

Snoopy: How is that different though?

Nicole: It's different. It's for like eating it. I understand because you're going to eat it. If you're going to kill it, you should eat it. It [the dissection] was just sad. I was sad.

Again, the experiences of sadness come from what Nicole perceives here as a lack of respect for the cat. She articulates a different form of ethical engagement.

### **"Cats Have a Purpose to Educate Us"**

In concluding the conversation, I asked the students if they saw any value in them having been able to dissect animals in their science class.

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Nicole: It definitely gave us a ...

Snoopy: Nice experience. 'Cuz, what Ms. Bell was saying, is we usually we don't get to dissect as freshmen in high school.

Nicole: I don't know how, she told us we weren't going to dissect at the beginning of the year. Then we ... It definitely got us ready for the real world. Some of us are going to have jobs like that. It's the first real thing I've seen in high school. I've seen real things but the first ... eye opening kind of a thing. Like people do this for a living. This is how you do it. They have to do this kind of stuff every day.

Snoopy: Kind of got people thinking about maybe ... it was kind of a hands on thing. If you want to do this, this is how it's going to be. You got to experience if you want to do this when you get older.

The students somehow equate being able to do dissection with job preparedness but they do not seem clear about what type of job might require them to do this work, other than medical professions referenced earlier; however, they understand that dissection was an integral part of their teacher's professional training as a pathologist. The 'apparatus' (specimen + dissection tools) affords pre-professional training.

Nicole: It also taught me, you have to cut off your emotions for this situation, because I want to cry. And I think I did cry. I teared up, and I was like, oh, my God... I also put myself in the way like cats have a purpose to educate us, I guess. And give us the new experience. But that was the mindset that I had to put myself in while doing the dissection. I was pretty sad though.

Snoopy: I mean it was good that we did it. Because not a lot of high schools actually ... the schools don't support that, because it's expensive to get cats. And a lot of schools don't buy them for science classes. But we were able to get it and actually dissect them.

Nicole and Snoopy try to resolve some of their dissonance around the dissection. It is not the killing of the cat *per se* that Nicole is opposed to. Here both Nicole and Snoopy try to reconcile their dissonance, disgust, and discomfort by 'cut(ting) off [her] emotions' so that they can allow the cat some agency in educating the students, in providing them with a new experience. Snoopy also identifies the contexts of economic oppression that she, her family, and the school face regularly, highlighting the dissection as an exception in this case.

### **Re/visioning a Queer-Feminist Science Classroom**

If orientations are an effect of what we tend toward, then they point to the future, to what is not yet present (Ahmed, 2010: 247-248).

Indeed, intra-actions iteratively reconfigure what is possible and what is impossible (Barad, 2007: 234).



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Thinking with Sara Ahmed, Karen Barad, Nicole, Snoopy, Marcos, Ms. Bell, Edwin, and myself 'produces questions [and perspectives] not possible otherwise' (Mazzei, 2014: 745). Generally speaking, scholarship on dissection has fallen along the binary of either 'for' or 'against.' The perspectives and orientations constituted through the dissection in this study reveal a more complex array of differences: They helps us contemplate questions such as: How do different participants orient to the apparatus: specimen + dissection tools? How are their orientations informed by their inheritances, differences, along the lines of gender with race, culture, class? How do their differing orientations as students of science help us, as scholars, teacher educators, feminists, orient differently to the *phenomenon of science teaching*? Lenz Taguchi & Palmer (2013: 684-685) affirm that:

Children, youth, and adults need to collaboratively engage in practices of intra-active engagements of imagination, where multiple images and discourses about the school environment, ill- and well-being, are allowed to be expressed, enunciated and actualized.

The focus group conversation offered an opportunity for students to articulate their 'intra-active engagements of imagination,' where multiple, differing discourses about the dissection experience were 'expressed, enunciated and actualized' in ways that the science classroom space may not have afforded. Revisiting my own experiences as a science teacher, I wonder what would have happened if I had allowed Edwin, and his peers, the same opportunity? Perhaps Edwin's orientation to school and science would have been constituted differently in a science classroom that acknowledged and valued various forms of ethical and feminist resistance to scientific practice.

Bazzul (2015: 502) writes that science education should cultivate 'resistance to the dominant structures of science and science education that work to constitute students, teachers, and citizens as subjects,' and argues that 'being-through-resistance from below happens in community with other bodies.' Science educators can help students like Nicole re/conceptualize leadership as resistance rather than as a way of getting people to do things they are not ethically comfortable with. When leadership is positioned as conformity to dominant perspectives, women and people of color are marginalized in the science classroom and in science. Science educators can also work to deconstruct these hegemonic masculinist conceptions of leadership which exclude and marginalize women.

Though all three students viewed being able to dissect cats as a 'privilege,' educators and students can deconstruct certain economic privileges differently as well—as not just worthy of striving for only because they are available to well-resourced schools. A feminist science pedagogy grounded in the interests and concerns of the most marginalized students in science class and society can reveal alternative lines of flight beyond simply access to dominant resources (Harding, 2015). Weinstein and Broda (2009: 778) suggest that 'the grotesque is a key resource in any curriculum seeking to queer science education, rewrite it so that the excluded, the marginal, and oppressed find a place of transformative possibility within those fields we call science'. Making the abject visible (dissection as a horror for some, a pleasure for others) could have been another way to open up a conversation with students about the abject nature of science

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and scientific practice. Students could use their divergent orientations as grounds for discussing ways in which scientific practice has been both beneficial in some contexts and oppressive in others—as well the ways in which it has privileged the interests of White men while marginalizing the experiences and concerns of women and people of color. Making the abject visible can, then, be a key part of ethical engagement with socio-scientific practice.

Students orient, or re/orient, to science through their teacher, their own experiences, and through the material/discursive context of school science activities. This chapter has shown that eliciting and acknowledging students’ contrasting orientations can help us better understand the ways that the discursive and material contexts of school science, and scientific practice, work together to constitute subjectivities that simultaneously reproduce and disrupt intersecting systems of oppression along the lines of race, class, gender, etc. The “specimen” and cutting tools affords the opportunity for girls to disrupt gender norms, queering their own identity as “girls,” in a sense, by “acting creepy” or taking on pre-professional identities as medical students. Both Barad (2007) and Ahmed (2006: 33) point out that thinking about/with/through objects also means thinking not only about their characteristics and functions “but also what they allow us to do”, whether it be to perform a “creepy” identity, or take on a pre-medical orientation, or facilitate students’ experiences with laboratory sciences in an otherwise resource-deprived context of oppression.

Revisioning science education from a feminist perspective requires engaging feminist critiques of science, such as those articulated by feminist scholars as well as students like Nicole and Snoopy, while also actively facilitating a feminist classroom space through which possibilities for the transformation of the sciences are cultivated (Mayberry, 2001; Scantlebury, 2014). In this case, the dissection activity was intended to “give” low-income minoritized students access to a college level science experience but at the same time traditional and even re-colonizing notions of access required two girls of color, Snoopy and Nicole, to re/orient toward a school science activity as both “job preparation”, as an activity distinct from their emotional selves. Secondary school is such a critical stage of becoming for students, and this is crucial in science and science education when students are making implicit or explicit choices about “is science me?” or “is science useful?”, or even “can science really ever be about justice?”. This dissection activity has indicated that, in one sense, students orient toward but, in a larger sense, they orient away from school science. This is particularly the case for Nicole, who is so emotionally engaged that, as we see throughout the discussion, for her, to “cut off” one’s emotions requires a huge compromise to her identity: “Bodies tend toward some objects more than others given their tendencies” (p. 247, Ahmed, 2010). The students’ perspectives, then, challenge us to consider how science educators can be differently prepared *NOT as representatives of* scientific communities but to develop a role as interlocutors of/within more critical, multilogical socio-scientific practices. As such, students’ multiple gendered, cultural, and ethical subjectivities can be nurtured as well as critically transformed.

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